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Rail-Road News.

German Railroads.

Germany began to experience the luxury and benefit of fast and comfortable riding in the year 1848, by constructing the railroad, of which eighty miles (more than 360 English miles), were completed in that year. At the beginning of 1850, there had been added 840 German miles more to the length, so that there were then more than four thousand English miles of railroad opened for passengers in that country. Add to these both tracks of the Maine Weser line, from Cassel to Frankfort, we have nearly fifty English miles farther. Of the aggregate, over fifteen hundred miles belong to the different governments.

Prussia owns an extent of three hundred and forty German miles; Austria, one hundred and eighty-seven; Bavaria, eighty-two and a half; Saxony, fifty-five and a half; Hanover, forty-eight; Baden, fifty-two; Electorate of Hesse, thirty-three; Wurtemburg, twenty-five; Mechlenburg Schwerin, nineteen; Anhalt, twelve; Brunswick, eleven and a half; Saxe Weimar, ten.

The Wurtemburg Railroads, and the Budweis-Linz-Gmunder horse line, are quite isolated. The upper Rhenish Railroad system, which comprehends the Baden government line, the Maine Neckar line, the Palatinate Ludwig's line, the Taunus line, and the lines from Frankfort to Offenbach, Hanau, and Friedburg, is separated from the large North German system of roads by the unbuilt portion between Friedburg and Marburg, as the Bavarian lines are separated by the tract from Plauen to Reichenbach, and the Austrian southern line by the tract from Gloggnitz to Muerrzuschlag, (over the Sommering.) Forty-one joint stock companies own the private lines, and their funds amount to one hundred and fifty-eight and a half million thalers. To this other loans should be added, of sixty-two and a half millions.

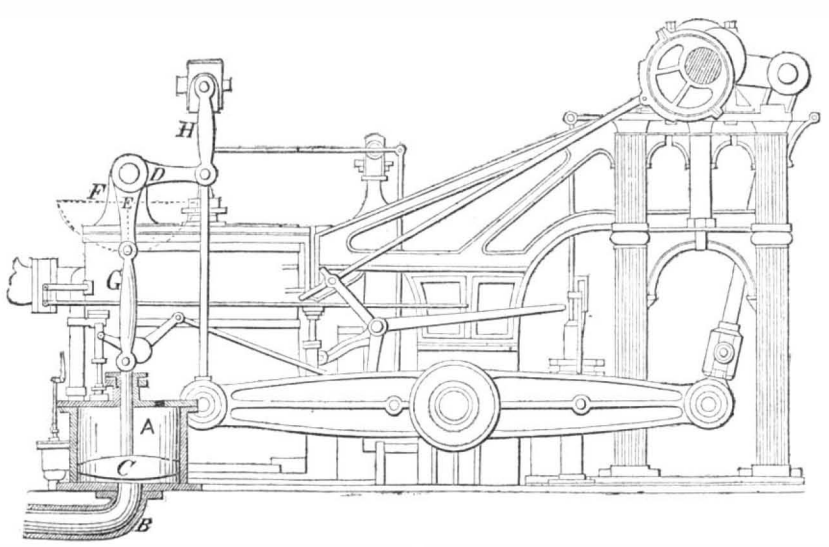
Railroad Law in Ohio.

An act has recently been passed in Ohio, anthorizing two or more railroad companies, whose roads run in a continuous line, to be merged into one, and authorizing any railroad company to assist another by subscribing to its stock.

The Alexandria Gazette states that the work on the Orange and Alexandria R.R. is in a very prosperous condition. The work of laying the rails in the city is to be commenced forthwith. Two thousand men are at present said to be employed on the Lynchburgh and Tennessee Railroad, and the first 61 miles are expected to be opened during the present year.

The Toledo Blade states that the Lake is gradually falling to its minimum level—an event that occurs every 10 or 14 years.

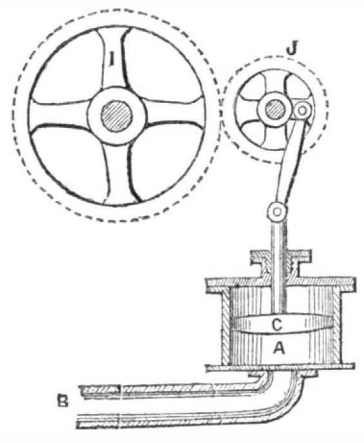
GREGORY'S ENGINE POWER-REGULATOR.---Fig. 1.



This novel device is the invention of Mr. Alfred Gregory, of Brooklyn, N. Y., who has taken measures to secure a patent for the same. Of its practical utility and highly important advantages we feel convinced, and our opinion coincides with that of several well-known engineers, among whom are Messrs. Stillman, Allen & Co., of the Novelty Works, in this city, whose written acknowledgment of its merits we have seen.

The object of the invention is to render more generally available, both in marine and land engines, a large expansion of the steam, which may, by the adoption of this plan (applicable at a small cost to engines now in use) be "cut-off" much earlier in the "stroke" than is, by the present means, practicable. The economy in fuel which ensues by cutting off steam in the cylinder, has long been established, which economy is still greater when steam of "high pressure" is employed, and is dependent upon the period of "cut-off," even with "low pressure," in the following proportions,—steam stopped at one half of the stroke has its performance multiplied one and three quarter times; at one quarter of the

Fig. 2.



stroke, two and a half times; at one eighth, three and a quarter times, nearly. Thus we see the great advantages attendant upon thus working the steam, especially in ocean navigation, where a reduction in the necessary amount of fuel entails not only a diminution of expenditure, but a yet greater economy in the additional stowage room applicable to freight, as well as accomplishing that most important result—the adaptation of steam power to long voyages. In few instances, only, by the means in present use, can any considerable amount of expansion be adopted, as the variableness in the actual propelling force of the piston produces a want of uniformity in the velocity which even the fly-wheel (where admissible) is very limited in regulating: to equalize, modify, or regulate this difference, and to obtain the advantages derivable from a greater degree of expansion, is the design of the invention under notice, which is done by taking off force from the propelling power of the piston at the early part of its stroke, when the steam is full on, or strong, by means of a "drag," which returns the force consumed, or operates as an "auxiliary" during the remainder of the stroke, when the steam, by expansion, has become weak. The apparatus for effecting this desideratum is very simple, and, with a little study, will be readily understood by reference to the annexed engravings, which we shall now proceed to describe.

Fig. 1 represents a Marine Steam Engine with the Power Regulator attached. Figure 2 is a detached view of the Regulator, operated for the purpose of illustrating its action, in a somewhat different manner.

In figure 1, A is a cylinder of small diameter, to the bottom of which is fixed a pipe, B, freely communicating with the steam in the boiler. C is a piston working in the cylinder, A, and which moves once up and once down, while the engine travels once either way; the steam acts only on the under face of the piston, C, which may have a vacuum above it, or be exposed to the atmosphere. D and E are arms forming a bell crank secured to a shaft vibrating in its bearing, F; and G is a connecting rod attaching the arm, E, to the rod of the piston, C. H is a similar rod connecting the arm, D, to a branch from the rod of the engine piston. These several parts or portions of them may be repeated on the other side of the engine by way of obviating lateral or uneven strain. In fig. 2, the Regulator is driven by wheels in lieu of the bell crank and connecting rods, the wheel, I being keyed on the main or engine shaft and driving the regulator by gearing into the pinion or wheel, J, of half the diameter of I, which will cause it to run two to one, and thus the piston, C, will make two strokes for one stroke of the engine piston, which is also the case in fig. 1, as will be perceived by reference to the travel of the arm, E, indicated by dotted lines or arc; and in the operation of the apparatus it will be seen, that the piston, C, is forced down against the pressure of steam under it during the travel of the engine piston either way until it reaches the middle of its cylinder, thus acting as a drag when the steam at the early part or half, of the single stroke is strong; and as the steam, by expansion becomes weak during the travel of the remaining half of the engine piston's stroke, the piston, C, in being worked upwards, is aided by the same pressure of steam under it which had to be encountered in the descent, and thus, in the ascent, serves as an auxiliary in counteracting the deficiency of the propelling power of the engine piston, caused by expansion. The changes thus produced, being gradual, by the difference of leverage during motion, which gradual effects are in unison with the regularly diminishing strength, by expansion of the steam, (the forces of the drag and auxiliary being greatest at the two points requiring their strongest effects). The piston, C, in performing two strokes for one stroke of the engine piston, will have completed its descent or operation as a drag, when the engine piston is half way of its cylinder, either way, as shown in fig. 1: and during the finishing part stroke of the engine, the piston, C, in rising, will serve as an auxiliary, gradually increasing in strength by the difference of leverage, as the steam in the engine cylinder is growing weaker. It will be perceived that no steam is allowed to escape from under the piston, C, consequently no power is consumed except the slight friction to work it, the regulator not discharging steam each stroke (nor at any period) as is the case with the engine piston—the steam under the piston, C, and in the cylinder, A, always freely communicating with the boiler. The piston, C, requires to be but of small dimensions, as it is constantly acted upon by the "full" or extreme pressure of the steam; and any fluctuation of the pressure in the boiler affecting the power of the engine, will be proportionally felt in the force of the Regulator, which, in its action, thus serves to admit of a large degree of expansion being worked without affecting uniformity in velocity, through its tendency to equalize the propelling force or modify the attendant variation.

The Regulator may be operated by the engine in various ways, to suit circumstances, or according to the judgment of the engineer. Further particulars, future terms, &c., may be had by addressing the inventor, at this office

To Dye Hair Black Instantaneously.

Dissolve about an ounce of the nitrate of silver in a half-pint vial; then, in another vial of the same size, filled with ether, put some phosphorous (about half an ounce.) Apply the nitrate of silver to the whiskers with a sponge, and after it is on about five minutes, apply the phosphoric ether solution in the same way, and the red or light whiskers become black, as fast as you can say "Jack Robison." The hair should then be washed. It is not safe, however, to tamper with the nitrate of silver. It should never be used to color the head black; far better to have the locks frosted than colored, if health is of any consequence to the individual man. We have had some enquiries about the way to dye the hair black within the past week. The above will give them all the information they want. The phosphorous may be dispensed with, but the color will not be formed so fast by the silver alone. The nitrate of silver is the basis of all the perfumers' hair dyes. The phosphorous gives out no very pleasant smell, but the silver has a very pleasant odor.

Fact in Ornithology.—The quills of the feathers of birds are air-vessels, which can be emptied and filled at pleasure. The gannet or solan goose is a beautiful instance of this wonderful provision; it lives on fish and passes the greater portion of its time either in the air or on the water; even in the most tempestuous weather it may be seen floating like a cork on the wildest waves. It can even force air between its skin and body to such a degree that it becomes nearly as light and buoyant as a bladder.

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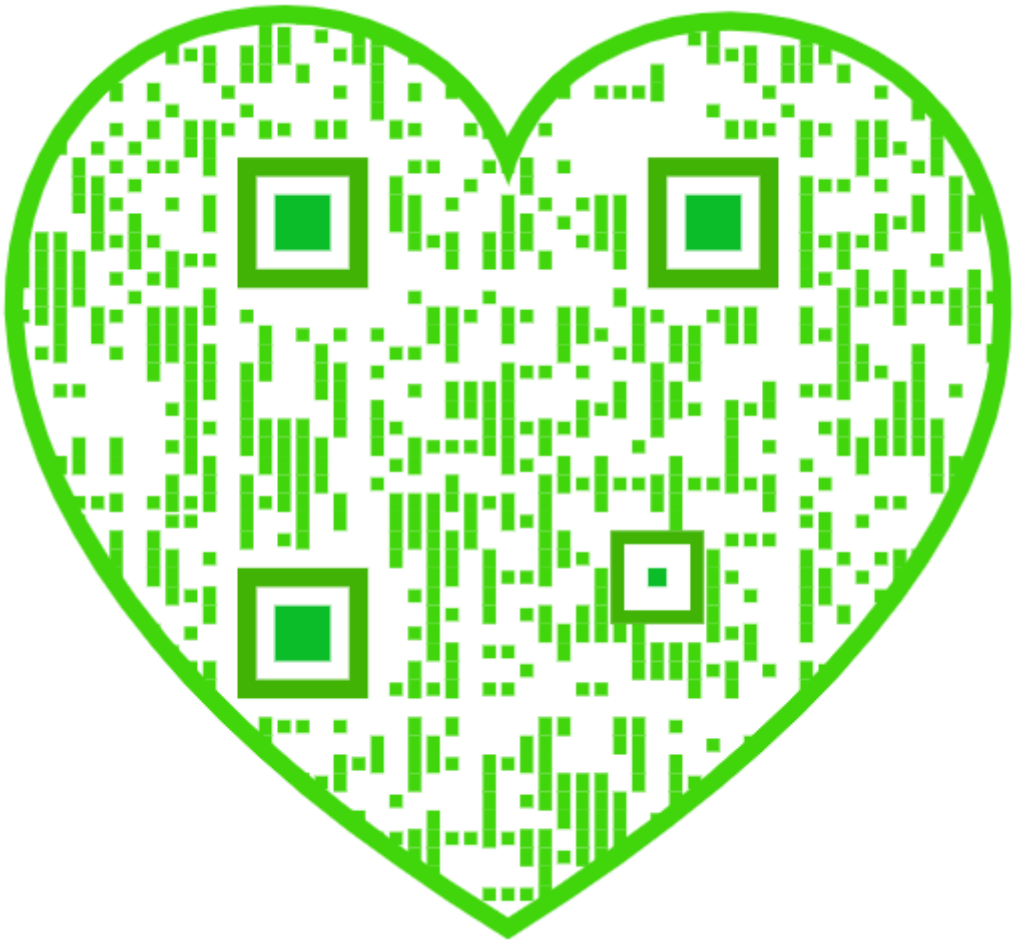


Miscellaneous.

Foreign Correspondence.

London, 28th March, 1851.

Some suspicions have existed respecting the water-tight qualities of the roof of the Crystal Palace. It always leaked a little from the first, and it is no easy matter to keep out the water in this dripping climate. Last week there were very heavy rains and the water has penetrated in so many places that serious fears are entertained by some as to the practicability of securing that exemption from drip or damp which is indispensable in such a building. The desired object, it is said, can still be accomplished by administering a thick coat of paint to the sash bars on the outside; but this constitutes a formidable addition to the work which the contractors have now scarcely six weeks to finish. Messrs. Fox and Henderson have done wonders, but their reputation is indissolubly bound up with the satisfactory manner in which the Crystal Palace fulfils the objects for which it has been created. If its gigantic roof cannot be made water-tight, Mr. Paxton's design, and their execution, will be equally condemned as failures.—Fancy the exhibitor of costly brocaded silks from Lyons, or of rich velvets, from Genoa, watching the effects of a summer storm of rain oozing through the great window frames above his head, and drop after drop irretrievably tarnishing the rarest products of his taste and skill. The contractors and the Executive Committee are both fully alive to the necessity of curing this defect, and accordingly, during the past few days, the glass roof of the building has been in possession of gangs of painters and glazers, who carrying their scaffolding about with them, and apparently like flies, without specific gravity, crawl about in every direction, stopping up chinks and crevices with putty and paint, and repairing fractured panes of glass. Every effort is making to remedy all defects so as to have the building ready on the day appointed.

Two days ago, the American contributors to the Industrial Exhibition, agents, and those interested met at the Chapter Coffee House, Paternoster Row, where a number of resolutions were passed condemnatory of the management of the exhibition. The resolutions have not been made public, but the price of three guineas for a season ticket was condemned, so was the government for not passing laws to protect the unpatented articles sent, likewise the fittings which foreign exhibitors are compelled to put up at their own expense, also the appointment of so many English jurors to decide on the prizes. The latter complaint is a just one, but the others are no more unjust to the foreign than the English exhibitors. There will be much dissatisfaction among the exhibitors of every nation—this is to be expected. I wish that our countrymen had passed open resolutions and discussed them quietly. This is the best way to do, so as to direct attention to the removal of evils. The complaint is then looked upon as just, whereas, when private meetings are held, the many are always sure to take an unfavorable view of such proceedings, however reasonable the causes may have been to invite private concert of action.

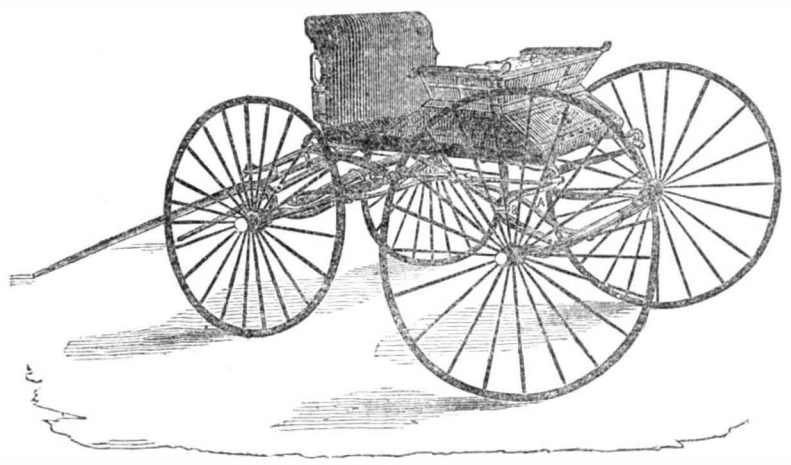
I have been informed that the commissioners of the exhibition have nearly settled all disputes. A very large French organ is to be placed in the *nave*, and will send its thrilling notes throughout the wide expanse, delighting the people of every nation, kindred, and tongue. The Chinaman, the Greek, the Roman, the Hindoo, the Persian, the Turk, aye the Arabian, and the Young American, will hear together under one canopy with the products of peace and industry, the sublime strains of Handel, Mozart and Hayden. Many of the American packages from the St. Lawrence have arrived; an air tight metal-coffin from New York City, with a bunch of fresh flowers in it, has been greatly admired, as it somewhat resembles an Egyptian sarcophagus. McCormick's Grain Reaper, from Chicago, has been particularly remarked.

The space devoted to the exhibition of British articles is in a very forward state of arrangement. The Irish poplin goods now arranged make a beautiful show, so do the plaids of Scotland, and the silks of Spittalfields in England, are very excellent. No less than 103,744 square feet are devoted to the exhibition of British textile fabrics,—these manufactures no doubt are the most important to England.

Great preparations are made by the Londoners for the reception of visitors. Portable metal bedsteads are now very plenty, and there can be no doubt but many of our countrymen, shrewd as they are, and keen as they are in making bargains, will pay dearly for the whistle. No one should come here unless he has plenty of money to spend and spare.

Excelsior.

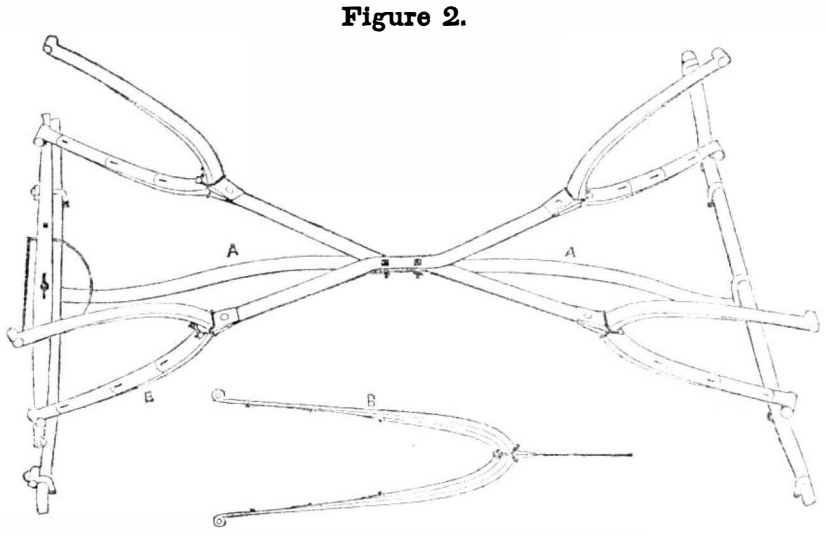
SPROUT'S PATENT CARRIAGE SPRING.---Figure 1.



This carriage spring is the invention of Mr. E. T. Sprout, of Hughsville, Lycoming Co., Pa., who has a patent for the same, and who has been awarded some prizes as a token of its superior character.

Figure 1 is a perspective view of a carriage, and figure 2, with a view of the spring, is a plan view, showing the spring as combined and arranged with the axles and frame part below the body of the carriage. A A is the perch plate, and B B represent four springs connected by cross plates, and to the perch plate. These are all made of steel, and for a two seat buggy they weigh only from thirty to forty pounds, (springs, braces, and perch). Section B is a side view of one spring. It will be observed, from the peculiar manner in which all these parts are connected at the middle of the braces, that the springs support the body of the carriage at the front and rear, by merely resting on the axles. The axles and wheels are thus relieved from *dead weight*, as it is technically termed, and the ends of the springs vibrate freely on the axles, obviating all unpleasant jarring and jolting when the carriage is running over a rough road. The whole arrangement is very simple; bolsters and pillow blocks are not required, while the carriage is braced most effectually in every part. The perch being a spring, also assists, by its gentle elasticity, to render the motion of the carriage, to those who ride in it, pleasant and easy. These springs are manufactured by Mr. Wm. Wright, Newark, N. J.,

Figure 2.



also by Messrs. Sprout, Burrows & Co., proprietors, Hughesville, Pa., from whom more information about prices, &c., may be obtained by letter.

Messrs. Editors—You were in error in stating, in No. 28 of your paper, that, in my application to the Legislature to make the use of the lancet, in diseases, penal, I said that "I had *practiced* medicine more than *fifty* years, and that the result of *my* experience with the lancet convinces me that the habit of bleeding is destructive of health and life." As I am not yet fifty years old, the first part of this quotation is manifestly impossible. And in reference to the second part, what a pretty figure I should cut in asking the Legislature to protect the public against *my own* experience!" What I said was, that "I *commenced* the study of medicine nearly a third of a century ago, and that the result of my study and my observation of the experience of *others* was, that the lancet is destructive," &c. &c.

Wm. Turner, M. D.

New York, April 4, 1851.

[No one could certainly mistake our paragraph in reference to the use of the "lancet in diseases." The caption of the article, and the "habit of bleeding" mentioned in it, surely could not fail to point to *the* particular use exclusively of the lancet, as embraced in the petition. The other part of the article required the explanation.

How we Pay for Tea.

The imports into the United States from China, in 1844, amounted to $6,686,171, while our experts to that country were only $1,320,-170—balance against us $5,366,001. In 1849 our imports were $11,904,754, exports $1,490,-945—balance against us $10,413,809. In five years our imports increased fully sixty per cent., and our exports did not increase over twelve per cent. It appears that during the same period, that is, in 1844, the exports from Great Britain to China amounted to $35,929,-132, while her imports were only $17,925,350 leaving a balance of trade against China of $18,003,782. The principal articles of export from Great Britain to create this large balance against China consisted of raw cotton and cotton fabrics; the raw cotton from British India, and the cotton fabrics from her home factories; both of which, and of a better quality, can be more cheaply supplied from this country.

But the next question that arises is, is China always going to supply us with tea? We trow not. It would appear that Junius Smith, M. D., of South Carolina, is in a fair way to make that state a tea growing one, and then what will become of the China tea trade? It will no doubt still be a great one, for the States that are yet to arise on the American side of the Pacific, will consume as much tea as all the nations of Europe now do.

Metallic Life Boats.

An item in the cargo of the United States frigate St. Lawrence excited some attention in the Southampton Docks yesterday. It is one of Francis's metallic life boats, and has been brought over by Captain Sands, consigned to Mr. Macgregor Laird, the iron shipbuilder of Birkenhead, who is instructed by the inventor to present it to the Shipwrecked and Humane Society in London, previous to which however, Mr. Laird has directions to have the boat drawn through the streets of London, by four horses, the bottom to be entirely unprotected, so that the strength of the boat may be severely tested. After this it is to be run against the London Docks stem on, with all the power of six oarsmen, and finally tried in the surf among the rocks of the most dangerous coast in England. This boat is built of galvanized corrugated iron, has air-tight tanks forward and aft, and cannot possibly turn over or sink. Its buoyancy is so great that it will sustain in the water as many human beings as can cling to it. The boat also cannot fill with water, because there are 10 or twelve plugs which, when opened, will let out all the water that may have got in heavy weather into the boat, and that may, in consequence, remain above the line of immersion.—[London Standard.

The above boat is well known to all our readers in New York. It is one of Francis's Life Boats which proved of such valuable service to the U. S. Expedition that made the descent of the Jordan and navigated the Dead Sea.

For the Scientific American.

Reflection of Light and Sound.

The laws which govern the reflection of rays of light and vibrations of sound, are, in some respects the same. If the rays of light, proceeding from any object, meet with a polished surface, they are reflected in the opposite direction, making the same angle with the reflecting surface as when proceeding from the object, and to the eye of an observer, the reflected image of any object appears as far behind the reflecting surface as the real object is distant before it.

This law also holds good in regard to sounds—the reflected sound, which we call echo, seeming to the ear to be as far behind the reflecting surface as the real sound is in the contrary direction. Sounds, however, differ from light in that they may be reflected from any tolerably firm surface.

We will try to illustrate and explain the law mentioned above. Were an object to be placed in front of a mirror, at a distance of ten feet, and the eye of the observer at twenty feet, the image in the mirror would appear ten feet behind it, and thirty feet from the eye. It is plain that were the eye placed at the mirror, the appearance of the object would be modified by a distance of ten feet; consequently if the eye be placed in a contrary direction, at a distance of twenty feet, the rays from the image in the mirror—which is already ten feet distant in appearance—coming to the eye from that direction, make the object appear ten feet behind the mirror, and thirty feet from the eye.

In relation to sound, the fact is the same: if a person stand at some rods distant from a high wall, and speak aloud, he will hear the echo at the same distance behind the wall; the vibrations of air caused by his voice having passed from him to the wall and returned.

H. W. H.

Claremont, N. H.

The total number of deaths last week was 357. This shows the health of our city to be good. *Consumption* carries off the greatest number of victims, viz. 49; the next is *convulsions* 24.

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Scientific American

NEW YORK, APRIL 19, 1851.

Expense not Spared.

The magnificent engraving of the Glass Exhibition Building—not Palace—(we don't like the name), which we have the pleasure of presenting before our readers this week, was ordered from our agents in London expressly for the "Scientific American," and is probably the largest engraving, by far, ever published in a newspaper in this country.

The expense of procuring the engraving has been enormous, but if our readers are only pleased with it, we shall feel amply repaid for the expense and trouble we have been at in procuring it. Our Agents have been instructed to forward an engraving of the external view of the same building, which we hope to be able to present to our subscribers before the expiration of the present volume.

The engraving of the external view of the building, which we hope to be able to possess, will be of the same size as the one represented in this number, and will cost over $200.

This building was designed by a Mr. Joseph Paxton, who has been celebrated in England, for a number of years, as an ingenious superintendant of buildings for green-houses and rural decorations. The plan was conceived and elaborated in one night. Among the many plans proposed, and the competitors were men of no ordinary character, Paxton's was selected by the Commissioners, and his name will go down to posterity with the history of the World's Fair. The building is a vast one. It is 1,848 feet long, 408 feet broad, 66 feet high, with a transept of 108 feet in height, enclosing a row of elm trees. For a very minute description of it, we refer our readers to page 99, this volume, of the Scientific American. We do not like to take up space with the repetition of any matter.

There is an appearance of some dissatisfaction, as noticed by our foreign correspondent, between our American exhibitors and the Commissioners of the Exhibition. We have not any *particular* information respecting the main causes of the difficulty, we are not able, therefore, to express an opinion. We hope that all may end satisfactorily, but we do not believe this is possible. Many will be disappointed from just causes, and many, no doubt, will be so unwarrantably.

Mineral Naptha.

We have lately seen some specimens of a mineral naptha in the possession of Mr. F. Johnson, 327 Hudson street, this city, and which is a subject of curiosity and importance. It was obtained at Burkesville, on the Cumberland River, Ky. The naptha was obtained from a well which was bored, about twelve years ago, by sinking a shaft for a salt spring. After digging down through fifteen feet of earth, the borers came to a rock, through which they penetrated to the depth of 170 feet; and when the auger was then withdrawn, there spouted up, about twenty feet above the surface of the rock, a stream of salt water and what appeared to be a kind of oily fluid. This substance filled up the well and ran down into the river, no person appearing to take any particular notice of it, or to think it anything very extraordinary, except from its repulsive odor. A few years after this, a peculiar incident brought the subject before the people. While one of the steamers was passing down the river one night, a spark from her funnel fell upon the naptha, ignited it, and truly accomplished that supposed impossibility, "setting the river on fire." The news soon spread abroad, and thousands went to witness the phenomenon. Public attention being thus attracted towards it, the fluid was examined, and found to be of an invisible-green color, and of a strong pungent odor. Its composition is said to be coal naptha, in combination with some sulphur, turpentine, and iron. It is no doubt the product of subterranean action among the coal strata underneath.

Among the first uses to which it was applied, was the healing of sprains and bruises in horses and cattle, and for these cases it was found to be an excellent remedy. It was then extended in its application, and for some years it has been successfully applied for burns, bruises, rheumatic pains, and especially, as we are informed, with great curative effect, to cancers. It is an excellent solvent, and were it not for its pungent smell, it would be universally used as a meat preservative. The well belongs to a company, and the gentleman whose name we have given above, received some bottles, to introduce it to the attention of the people of the East. The supply is exhaustless, but it is very volatile, and when exposed to the atmosphere for some time it is absorbed and carried aloft on the wings of the wind.

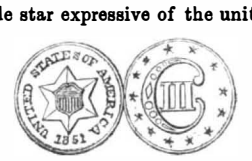
California Fifty Dollar Gold Piece.

We here present a fac-simile of the new California $50 gold piece, the size of the above engraving being precisely the size of the coin. The letters represented outside the rim in the above cut do not appear in that position on the coin, but are pressed in on the edge in a similar manner to the words impressed on the old American half dollar pieces. The first of these $50 pieces came in the "Empire City," and we are indebted, to Messrs. Weeks, Kelly & Co., for the loan of one sufficiently long to take the above sketch, which may be relied upon as correct, and which we have not before seen published.

It is not circular but octagon, having on each side of the edge the following sentence:—"Augustus Humbert, United States Assayer of Gold, California, 1851." It contains the figure of a spread eagle, with a scroll in his talons, on which is inscribed "Eureka." Underneath are the figures and initial, "50D," of course meaning $50; and over the eagle are the following figures and abbreviation of the word thousand, as follows: "887-thousand," designating its fineness, namely, 887 carats out of 1,000 pure gold. Its diameter is not greater than that of a silver dollar piece, but it is thicker. The new State, whose motto is "Eureka," must have $50 pieces.

The Three Cent Coins.

These are representations of the new three cent coin, which was ordered by the Act of Congress to meet the demands of the new post office law, that goes into effect on the 1st of July. The C with the numerals III, means three cents. They are surrounded with 13 old Star States. On the reverse side there is a single star expressive of the unity of our



confederation, with a shield upon it; and around it the usual legend, United States of America, and the date, 1851. The devices are new and simple, and perfectly conformed to the law, which provides that they "shall be conspicuously different from those of the other silver coins and of the gold dollar."

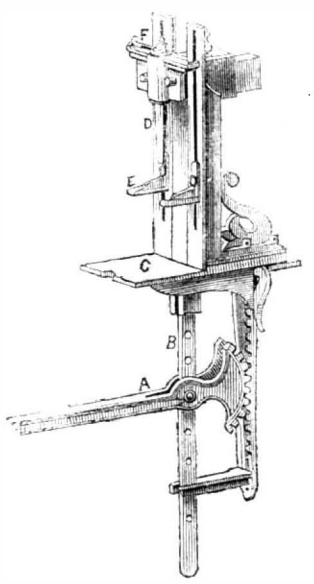
The metal is composed of three-fourths silver and one-fourth copper, and will always retain a silvery color, though not quite equal in that respect to the other standard. It leaves a margin of profit to government, which the other coins do not; the reason of which may be explained as follows: The original bill for this coinage, prepared before the postage bill was initiated, contained another provision by which the worn out Spanish money which circulates largely amongst us, and which is everywhere regarded as a nuisance, should be drawn into the mint and worked up. But, in order to effect that, it was necessary to provide means for buying them at their nominal value, or not much below it; otherwise, the people could not be expected to make the sacrifice—those coins being really worth some ten or twelve per cent. less than their current value, by reason of wear. The reduction of fineness from nine-tenths to three-fourths in the three cent pieces was therefore intended to enable government to call in the fips, levies, and quarters, as also to pay expenses of transportation, insurances &c.

In reference to the adulteration Thompson's Bank Note Reporter says:—"It is somewhat thinner and smaller than a half dime, and while new has the appearance of silver, with rather a slippery feeling; 3,333⅓ of these pieces make a hundred dollars, and contain $83,33 of silver, leaving a profit in the hands of the Mint of $16,67 on every $83,33. A dead swindle of full 20 per cent. God save the Republic."

The Treasury Department has authorized the mint to withhold the same until there shall be an accumulation of half a million pieces to start with. They will no doubt be ready by the beginning of May, as the coinage has commenced. They are to be paid out in sums of thirty to one hundred and fifty dollars, that is, one thousand to five thousand pieces—and will be exchangd for American gold or silver coins, or foreign silver coins.

Compact Mortising Machine.

The accompanying engraving represents a very convenient and compact mortising machine, all made of good iron and steel, manufactured by Mr. J. S. Alcott, of Oriskany Falls, Oneida Co., N. Y. A is the lever, B is a flat pitman, through which a pin passes in any of the holes, forming the axis of the lever. The inner end of the lever is a segmental rack meshing into a straight vertical rack united



to the table, C, behind. The work to be mortised is secured on this table, and there is a vertical plate with slots and set screw clamps, E, for holding the work down. Thick and thin blocks are secured on the table with the same facility. D is the mortising chisel secured in the cutter box, F. The pitman, B, is secured to the plate on which the chisel, D, is fastened, therefore, as the lever is operated the pitman, B, works the chisel to mortise the work on the table. This mortising machine is very simple, portable, strong, and effective. The price is $20. Address Munn & Co., at this office. We will supply all orders with faithfulness and dispatch.

Steamboat Challenge.

Mr. Darius Davison, of this city, advertises in the Tribune that he will undertake to build a steamship, and to enter into contract with responsible parties in the United States or England, that she shall be unequalled by any vessel afloat, and that she will run 100 miles further in 24 hours. The terms of the contract are, that upon his building a vessel within 18 months, possessing the qualities set forth, the opposite contracting parties shall pay him a quarter of a million of dollars, and will have the privilege and right to purchase *said* vessel by paying therefor the cost of building her together with the right to run her on any route while she lasts. He is also prepared, he states, to enter into a contract upon the same terms, nearly, to build a steamboat that will run to Albany in 5 hours, or at the rate of 30 miles per hour. The way we understand this, is, that if he does what he sets forth, he must be paid $250,000,—no other benefit to be derived by others than simply the privilege of purchasing the said boat, and also for the privilege of running her. He surely thinks that the world is filled with philanthropists. No parties possessed of common sense will enter upon such a contract. The advertisement looks more like a bravado than anything else. If he does not build a steamship, however, to perform according to the contract, he is to pay over $250,000. This appears to be fair, but no one, if he does build it according to contract, would get their value for the amount required to be paid. When he builds a steamship that will make a voyage to Liverpool, running at the rate of 100 miles per day faster than the Pacific, then we will believe he has made some grand discovery, but not before. Clear away the smoke, Mr. Davison, and let us see the effect of your shot. To pay you for your steamship, and *the right* to run her on any route while she lasts, is about as much as you might expect of any conscientious man. If Mr. Davison would offer to contract for building a vessel or vessels, possessing all the qualities set forth by him, and allow the parties the right of running them for a reasonable price, he no doubt would find numerous parties ready to enter into contract with him upon such reasonable conditions. To enter into contract upon any other conditions would be very unwise and imprudent in those of the second part.

Improvement in Forge Fires.

Mr. A. S. Beadleston, of Ausable Forks, Essex Co., N. Y., has made a valuable improvement in the construction of forges, for which he has taken measures to secure a patent. In connection with any forge fire used in the manufacture of wrought iron, there is placed an oven between the fire and the chimney, this oven is heated with hot air and the ignited gases proceeding from the fire. This oven is for charring the ore previous to its being introduced into the forge fire. It is so situated that the ore can be properly introduced into it and moved directly from it into the fire. The object of the invention is to save time and fuel by employing heat, which otherwise is wasted.

Paragraph to Editors and Publishers.

Editors desiring files of the "Scientific American," have only to insert the prospectus, which may be found on the last page in their own papers, 3 or 4 times, and forward a single copy to this office with advertisement marked. Editors and publishers upon complying with the above terms, will have forwarded to them a complete file from the commencement of Volume 6, and also the remaining numbers of the volume as they are issued.

Steam Job Printing.

Our neighbors, Messrs. Oliver & Bro., are prepared to execute all kinds of job printing in an expeditious and superior manner. Blank deeds of assignment, for the use of inventors, neatly printed, and show bills of any and every description. Also printing in colors, by steam, and all kinds of fancy cards. Messrs. O. & Bro. have the largest job printing establishment in New York, and are prepared with a variety of designs for every kind of job work. Office over the Scientific American Office: entrance 89 Nassau street.

A Golden Model.

MESSRS EDITORS—As an item of novelty, I inform you that I have recently made a set of drawings of a double acting forcing pump, from a model of which the barrel or working chamber, piston, valves, side posts, cross bars, double brake, and connecting rods, were all of solid fine gold. It was invented by Mr. E. K. Jenner, of California. Yours respectfully,

RUFUS PORTER.

Washington, April 12, 1851.

Professor Jacobi.

The European journals record the death of this distinguished Russian Savant, whose name is intimately connected with the discoveries made in galvanoplastics and electro-magnetic science. He died at Berlin.

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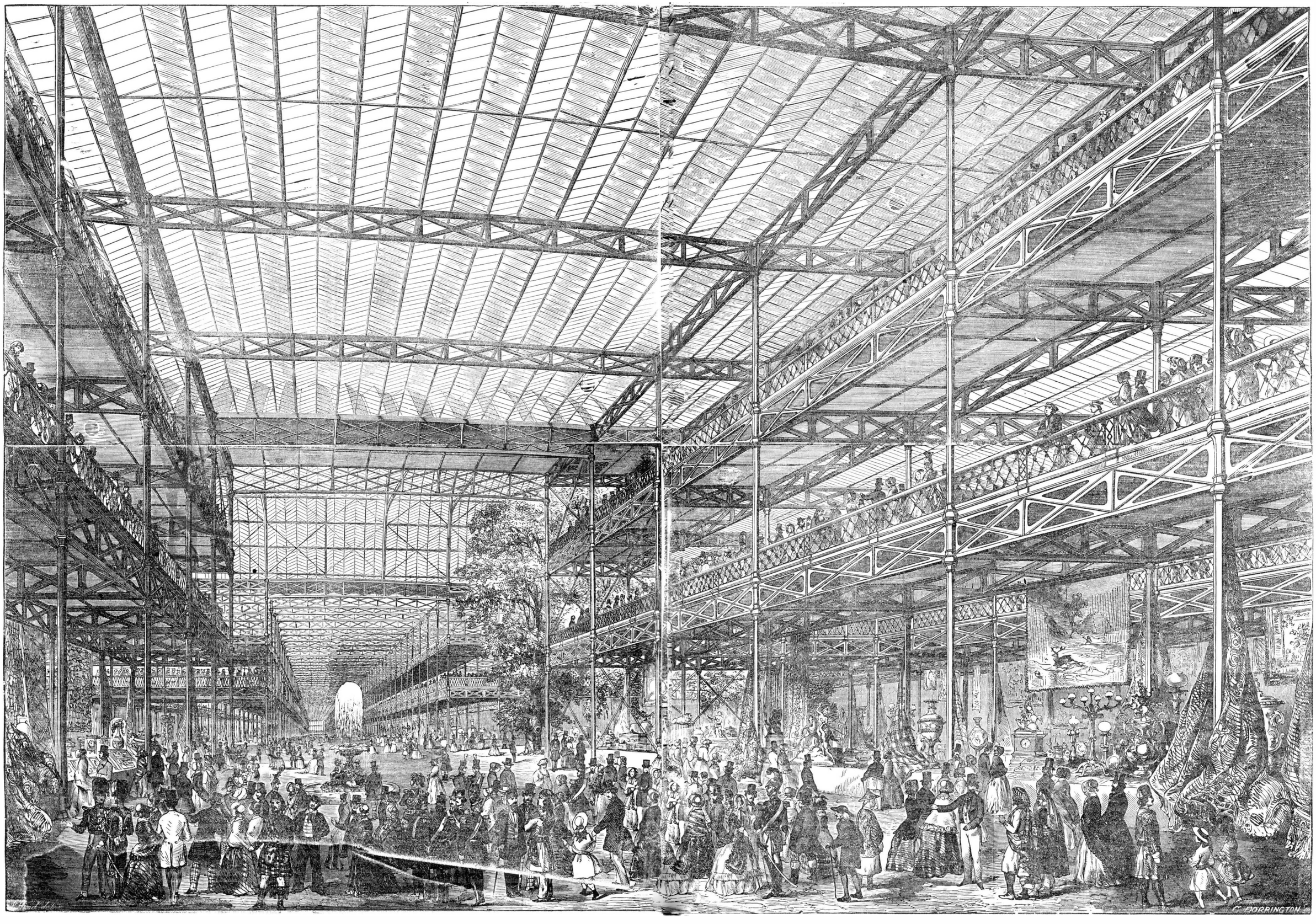
INTERIOR VIEW OF THE (AT EXHIBITION BUILDING.

(PREPARED IN LONDON FOR THE "SC [CAN," AND DEDICATED TO ITS SUBSCRIBERS.)



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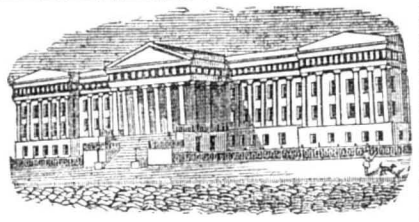

☞Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than anyother journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No char is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING APRIL 8, 1851.

To Pearson Crosby, of Fredonia, N. Y., for improvement in Sawing Machines.

I claim making the circular saw with both faces convex, in the manner and for the purpose substantially as specified, when this is combined with the guide, substantially as specified, for spreading apart the plank to prevent the binding of the saw, as specified.

To Lewis J. Mason, of Franklinville, N. Y., for improvement in fastening down table leaves.

I claim the combination of devices, by means of which table-tops of different forms and dimensions can be readily secured to and disconnected from the same frame, as herein set forth.

To I. Z. A. Wagner, of Philadelphia, Pa., for improvement in Brick Presses.

I claim the combination of the mould wheel with the grooved and smooth pressure roller, substantially as herein described; the grooved roller gauging and partially compressing the clay into the moulds, and forming a projecting band of clay, which is subsequently compressed into the moulds by the smooth pressure roller.

I also claim the grooves in the mould wheel in combination with the flanges of a hopper, which is supported on the frame of the machine, independently of the mould wheel; by which arrangement the clay is prevented from escaping laterally and working in between the teeth of the driving wheels; hence, the latter can be placed near to the moulds, and the machine thus made more compact, while, at the same time, the danger of breaking is diminished.

I also claim detaching the bricks from the pistons of the mould wheel, by means of the tappets and levers, as herein set forth.

To L. Faqui & H. C. Hayman, of Cincinnati, Ohio, for improvement in apparatus for bolting flour.

We do not claim the broad principle of bolting meal by a air blast, as this has been imperfectly done before, but what we do claim is the application of a blast cylinder, with spiral issues, as described, to the process of bolting flour or other pulverized material, by means of which, during a continuous blast, the meal is consecutively thrown against the bolting cloth, and so much as is not passed through at once, is given an interval of time to fall from the cloth, and leave open the meshes; and is thus, as it were, re-fed to the impulse of the blast from each succeeding issue; the intermittent action, at the same time, causing eddies that loosen, and, as it were, rip up the bran and flour from the cloth, separate the bran from the flour, and twirl the particles of bran in such a manner as to leave the flour free to pass through, while the bran, from the twirl thus given it, is caused to present its broadest surface to the bolting cloth, the specking of the flour being thereby prevented and avoided, the several parts being arranged substantially in the manner and for the purpose described.

We also claim the insertion of a set of beaters, at a suitable distance down the bolting cloth and blast cylinder, which, during the bolting process, shall interrupt the same, at a time when the bran requires beating, in order to loosen the flour from it, preparatory to the further continuance of the bolting process, substantially in the manner and for the purpose described.

We also claim the chamber by means of which the light flour carried up by the escape of the blast is re-gathered and returned to the usual gathering chamber, substantially in the manner and for the purpose described.

To E. S. Holkins, of Painesville, Ohio, for improved Saw-set.

I claim, first, supporting the lever by which motion is given to the jaws, by means of an adjustable stirrup, constructed substantially as described, whereby said stirrup serves as a gauge in addition to performing its ordinary duties.

Second, I claim the arrangement of the jaws constructed of one bent piece of metal, with the lever and stirrup, the handle of said lever projecting backwards towards the rounded part of the jaws, the whole being constructed substantially as described.

To T. J. Sloan, of New York, N. Y., for apparatus for setting up Ten Pins.

I claim elevating the pins of a bowling alley, by means of a set of elevating sockets, operated from the head of the table, when this is combined with any well-known device, or devices, which will permit the pins to fall, and sustain them in a vertical position after they are elevated, substantially as described.

To A. D. Crane, of Newark, N. J., for improvement in Horse Powers.

I claim the manner of arranging and connecting the whiffle-tree and brake, so that when the horse is drawing, the brake is off the wheel, or pulley, and when not, is on, and acting as a governor, as described, for the purposes set forth.

To Wm. Todd, of Stamford, Conn., (assignor to Chas. Atwood & Geo. Kellogg, of Derby, Conn.,) for tool for making Jack-Chains.

I claim the combination of the stud pins with the bending stud and holding dog, arranged and acting substantially as described.

To Celia R. P. Foster, of Canandaigua, N. Y., for improvement in Ladies' Work Tables.

I claim the mounting of the upper leaf and disc, with the drawers on the rotary standard, thus raising or lowering the whole, to suit different persons, by a screw.

I also claim the rotary disc with drawers hung thereon by the screw supported by the pin which can turn round the standard, independent of the leaf or standard, and raised or lowered as herein set forth.

To R. T. Merrill, of Bloomfield, Mich., for improvement in Grain Separators and Fans.

I claim constructing the elevator with double troughs, as described, for the purpose of preventing the grain from falling through between the cells.

I moreover claim the combination of the elevator, wind channel, and plate valve, with a grain threshing and winnowing machine, the former being constructed and arranged as herein described.

To Hiram Strait, of Covington, Ky., for improved Saw-set.

I claim the adjustable double bevelled slide saw-rest, constructed and used substantially as herein described, by means of which, its bevelled bed, the tooth-rest, upper jaw and punch, saws of all kinds can be firmly held, and their teeth be either set in V form, shouldered in U form, or be both shouldered and set to any amount required, to insure any degree of smoothness or roughness in sawing, whether their points are sharp or rounded.

To J. L. Booth, of Cuyahoga Falls, Ohio, for improvement in Winnowing Machines.

I claim the blast passages arranged and controlled by the shutter, in the manner and for the purposes substantially as set forth.

To R. K. Paine, of Cincinnati, Ohio, for improvement in Cooking Stoves.

I claim the three air passages between the fire back and the upper oven, the said passages receiving external air at the sides of the stove, and discharging it into the back flue, in combination with the damper and flues (seven) substantially as herein described, for the purpose of equalizing and regulating the heat to all parts of the ovens.

To Oliver Clark, of Medina, Ohio, for improvement in Scythe Fastenings.

I claim, first, making the shank of curved or arch form, longitudinally, as described, which enables it to be fitted to the snath, so as it may be set in or out, by giving it a slight motion in a curved direction.

Second, the mode of securing the shank so as to admit of the edge of the blade being set up or down, by making the cavity in the projection, through which the shank passes, widest at the back, and making the back edge of the shank and the inner side of the tightening key, of corresponding arch form transverely, so that the shank may be held secure in any position.

DESIGNS.

To Seth Williams, Jr., of Nashua, N. H., (assignor to Williams, Bird & Co., of North Chelmsford, Mass., Design for Stoves.

To S. W. Gibbs, of Albany, N. Y., (assignor to Jagger, Treadwell & Perry of Albany, for Design for Stoves.

For the Scientific American.

Gas Light.

The author of "Practical remarks on illuminating gas" in his preliminary statements says "that every effect witnessed can be traced to its own legitimate cause" If he means that all effects can or will be eventually traced to their own legitimate causes, I would raise no point of issue, but knowing as I do that the "remarks" are written for a certain effect in a certain quarter, I take the liberty to assume that the word *can* is used by way of intensity, and in the present tense, or in other words the force of the sentence is as follows: "All the effects that gas engineers and chemists witness *can* by them be traced to their own legitimate causes". The admission of this proposition paves the way for the following converse: "All effects witnessed by gas engineers and chemists which they cannot trace to legitimate causes are humbug." The whole article under consideration is written for the purpose of impressing this latter conclusion on the minds of a certain community in which an important trial, involving great pecuniary interests, is about to take place. The ostensible object of the article is the illuminating of the public mind on gas matters, while the real object is, unfortunately for the author's design, made apparent in the remarks on *new* and *false* lights. Having now made *my* preliminary remarks, I would enquire of J. B. B. if he *can* trace the effect of light and heat in the solar ray up to its own legitimate cause,—can he trace the various effects of electrical action up to their own true causes,—does he not know that in the chemical world there are so many effects witnessed whose causes have not, nor cannot as yet be traced, that a word has been coined to designate such inexplicable effects? J. B. B. assumes "that certain atomic combinations of carbon and hydrogen are necessary to the production of good light, and that carbon is the base of all illuminating gases, its richness and value being wholly dependent on it." I cannot permit this assumption, carbon is no more, nor so much the basis of illuminating flame as hydrogen. It simply forms one of a number of elements in *arbitrary* combination, the combination as a *whole* acting on the great luminiferous and true basis of artificial light—which is oxygen. Intense light can be produced in several ways, without the presence of carbon, but with the exception of the electric spark, no light can be made without either hydrogen or oxygen being present. Carbon therefore *is* not the basis of all illuminating gases.

A gas of higher illuminating power by 10, than oil gas, can be made by passing a cold stream of nascent hydrogen through turpentine. If the illuminating property was due to the carbon in the turpentine, some 40 ounces of the turpentine would be consumed by the passage of an ounce of hydrogen, but accurate experiments have proven that the passage of 10,000 ounces would not consume 40 ounces of turpentine. This single experiment is conclusive that "carbon is not essentially, but arbitrarily necessary to the production of luminiferous flame." By the authority of this unanswerable demonstration I deny the correctness of any remarks that J. B. B. may see fit to base on his assumed position.

H. M. Paine.

(For the Scientific American.)

Earthenware Pipes and Machinery.

Having seen in your truly valuable paper notices of pipes for conveying water, gas, &c., such as iron lined with glass, gutta percha, &c., I beg leave to say, that Messrs. Hill, Foster & Co., of this place, are manufacturing pipes of stone ware, the inside of which is a perfect glass, composed of nothing but clay as it is found at Albany, N. Y., commonly known as "Albany Slip." This clay is mixed with water to the consistence of whitewash, then, with a force pump, it is dashed on the inside of the dry pipe—thus coating the stone ware with a clay the most easily melted of any known in the States; so, when the stone or fire clay is by heat brought to a perfect stone body, the Albany clay is a fine dark colored glass: thus forming an article that cannot be affected by gas, water, or Old Time himself. Well might Commissioner Ewbank say that the water-works of Jerusalem are alone sufficient to have immortalized Solomon:—the city is still watered through ten-inch earthen pipes, all right, and performing the work he intended they should until the earth was rent asunder, and water ceased to flow. By the use of Messrs. Merrill's patent machinery this pipe is made remarkably cheap, fast, strong, and perfect, less than one half the cost of cast iron of the same calibre. After the ditch is ready, with good Roman cement, a man will put down from ten to twenty rods per day; it will stand one-third the pressure of cast-iron of the same thickness, and strength can be added according to the pressure it is required to resist. C. J. Merrill.

Middlebury, March 24, 1851.

A Curious Rudder—Necessity the Mother of Invention.

The ship Warren, which recently arrived in this city from Glasgow, Scotland, after the long and dangerous passage of more than 100 days, in which she sustained much injury and lost her rudder, had one constructed by her captain, John G. Lauton, which has been an object of curiosity and examination to officers of the Navy and of the Marine Insurance Company. The rudder consists of hemp cable spliced together and planked across for stiffening, secured to the sternpost by three chain bridles on each side, with hausers leading forward; also, a quantity of pig iron along its length, to prevent the sternpost from chafing the hemp rudder, and to prevent its floating. As a preventive to its being chafed asunder, small blocks of wood were attached to the hemp guys. The stock of the rudder is necessarily bulky, but not to such an extent as to remove all wonder at its effective strength. This rudder, begun, completed, and fitted to its place in twelve days, storms continuing throughout, was just being put into use, when a London bark spoke and offered assistance to the Warren, but so well did the new rudder work, and so satisfied was Captain Lauton of its efficiency, that the proffer was not accepted. This was in latitude 42 degrees 15 minutes, longitude 24 degrees 20 minutes. From this position, with a new rudder and a new top-mast—the last requiring an almost equal amount of nautical ingenuity, the Warren has come directly into port—saving to her owners and underwriters $15,000 by not turning back.

On hearing about this rudder, a friend of ours remarked, "if the Helena Sloman had either a Yankee or Scotch Captain, she would have been brought safe into port." If she had one like Captain Lauton, she undoubtedly would.

Patent Cases.

Before Judge Nelson, at the April Term, 1851, U. S. Circuit Court, in this city, suit for infringement of a patent in machine for Cutting Crackers; W. R. Nevins, patentee and plaintiff; H. & J. McCollum, defendants. The jury was out all last Friday night, and came in on Saturday morning, stating they could not agree: there were three who stood for defendants; they were discharged. Stoughton and Keller, attorneys, for plaintiff; Gifford for defendants.

The reward of $10,000 offered by the Legislature of Massachusetts for the discovery of a cure for the potato rot has been claimed by Mr. Joshua F. Hatch, of Dorchester. His remedy consists of ground charcoal mixed with sulphate of lime.

For the quarter ending March 31st, 1851, 6,409,171 letters passed through the New York Post Office.

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TO CORRESPONDENTS.

J. P. N., of N. Y.—We never saw a rudder hung as you have described, nor have we ever heard of it being used; but we cannot see what advantage you would gain by it. The line described by the outer edge of both blades is always equi-distant from the centre; there is no short curve in either case.

S. M., of New York.—You have been anticipated, both the central wheel and a long revolving set of buckets on an endless chain, have been proposed and tried. On some canals in England, railroads are built along the tow-paths, and locomotives are employed to drag the boats. The propeller is the best device for canal boats.

L. C., of N. Y.—The best work upon Architecture is Ranlett's: price $10, in numbers; $12, bound.

J. E., of R. I.—The work upon carpet looms has not been issued, and will not be for the present, as the author is now in Europe.

A. A. D., of Ala.—The machine you refer to is the best one in use that we know of; we have seen it operate satisfactorily on several occasions, and think it adapted to cutting all kinds of timber, although we have never seen it cut oak. There are three sizes, No. 1, $100; No. 2, $110; No. 3, $120.

E. J. U., of Ohio.—Your plan for constructing patterns for mould boards is, so far as we have been able to examine, sufficiently novel to warrant a trial for a patent; you had better dispatch a model to us for that purpose.

F. W. C., of La.—It would cost you $10 to have us get up a fine descriptive engraving of your machine and publish it in detail in the "Scientific American," which would be the best mode for you to pursue if you desire to dispose of rights. The regular weekly circulation of the Scientific American exceeds 16,000 copies, most of which circulate among the manufacturers and those having a taste for mechanical matters.

H. D. P., of N. J.—Diagrams of the various kinds of sewing machines which have been patented, you will find in the 4th and 5th volumes of the Scientific American; or by perusing the back numbers of the present volume you will find engravings of two or three of the most improved. Hubbell's Magnetic Engine was published in No. 48, Vol. 5, illustrated with 10 engravings. Prof. Page's Magnetic Engine we hope to be able to present to our readers, by diagrams, in a few weeks.

M. D., of Savannah.—By turning to page 137, Vol. 5, you will see an engraving of the machinery used in boring artesian wells, but we shall present engravings of other plans soon.

H. H. P., of Pa.—A furnace for the manufacture of cast steel, was illustrated on page 169, Vol. 3. Vols. 1, 2, 3, and 4 are out of print; Vol. 5 we can send you by mail in sheets, price $2; bound, $2,75.

L. & R., of N. Y.—The engravings of your carriage wheel were forwarded by Wells & Co.'s Express, on the 16th inst.

W. D. H., of Miner Sluice.—If you will have the kindness to inform us in what "State" Miner Sluice is located, you will hear from us by Mail.

T. P. S., of Pa.—Your eliptic wheel rotary would not be of any benefit, and could not be patented:—don't waste time nor money on it.

A. H., of Pa.—Your plan is certainly neither so simple nor so quick in its operation as the telegraph we published.

W. P., of Mich.—The principle of applying the power of water, either by re-action, percussion, or gravity, is well understood. No patent could be obtained for any application of these principles. No increase of power can be obtained beyond the actual weight and velocity of the water; weight and velocity is the golden rule of mechanics. We cannot advise you in any way to expend money on your invention.

W. W. J., of New York.—We do not believe your car handle is patentable.

D. E., of Ohio.—The mere application of a pump to a bath could not be patented; it has been applied to this purpose before. We do not discover anything new or patentable in your arrangement, and you are advised not to make an application for a patent.

A. W., of Ind.—There appears to be some originality in your contrivance, sufficient to warrant an application for a patent. You had better send us a complete model for further attention.

J. T., of N. Y.—You could probably obtain a patent for your improvement in cars, but the advantages do not appear. The expense must certainly be increased, inasmuch as supplementary wheels and rails would be required, and the necessity of a double track would not be obviated; if you can show any real advantage, we should like to hear it.

W. F., of Mass.—Yours next week.

J. W. N., of Phila.—The engraving will answer. You must give a description to correspond with the curves and figures on it. Let it be simple and clear. Our memorandum is lost.

G. C. B., of Ark.—You speak of obtaining hydrogen from the atmosphere. We should like to have you explain how this is done, as it is beyond our comprehension. We had always supposed that the properties of air were oxygen and nitrogen. It is from the aqueous vapor, we suppose, you derive it.

T. A., of Mass.—The reason why ornamental steel of a purple or lilac color, rusts more readily than polished or white steel, is because the lilac tinge is produced by partial oxidation, and the process which forms rusts has, therefore already commenced. It can be kept free from rust by keeping it in a dry place.

H. B., of Mo.—Engravings illustrative of Paine's apparatus for producing illuminating gas from water, will appear in the "Sci. Am." in a week or two: have patience.

A. O., of N. Y.—Yes; the two names which you sent will be considered as part of the club, when you forward the balance of the names, with funds. It will be necessary that you remind us of the circumstance of having forwarded names previously when you forward the other names.

J. E. W., of St. Louis—Your favor of the 24th ult., containing $13, came duly to hand: the subscriptions we have entered as you directed.

J. W. R., of Pa.—Many thanks for your fine club of subscribers, all of whom have been entered upon our subscription books, as you directed. Your proposals were satisfactory.

D. H., of Ill.—The curve line which a ball describes, if the resistance of the air be taken into consideration, is called a "parabola;" but when the ball is thrown perpendicularly upwards, it will descend perpendicularly, because the force of projection and that of gravity are in the same line of direction.

B. E., of Ohio.—The real discoverer of the magnetic properties of electric currents, was M. Oersted, Professor of Natural Philosophy, and Secretary of the Royal Society of Copenhagen. In a work which he published about the year 1813, on the identity of chemical and electrical forces he had thrown out conjectures concerning the relations subsisting between the electric, galvanic, and magnetic fluids, which he conceived might differ from each other only in their respective degrees of tension.

W. C., of Miss.—There is an error somewhere, in the calculations. The principle is correct.

E. E., of S. C.—The main rope by which a diving bell is supported, ought to be soaked in water before it is used; or it would perhaps be better if a chain were substituted; an instance occurred in the Bay of Dublin, where the rope, in undergoing the contraction water always occasions, caused the diving bell to turn round, by which means the signal strings were entangled, and two men contained in it were suffocated for the want of fresh air.

A. E. B., of N. Y.—We do not think, in fact we know, that the device is not new. See Commissioner's Report for 1848, page 960.

J. A., of Pa.—We know of no machine to raise water above the ground, on a constant stream, by the power of the water itself; we mean where there is no fall. The artesian wells, are an exception to this statement.

A. J., of Wis.—Your plan of the self-regulating sails has been extensively known for a long time.

V. L., of Pa.—We have seen plenty of fruit baskets made of wire. We do not believe you could obtain a patent for making the chair of wire: it is only an application to a different purpose, and is not patentable, but common property. Cast-iron, chilled, cannot be touched by the best files. We have never seen nor heard of such a wheel as you describe. The spiral streaks on gun barrels are put on by using weak acid for the light color, and stronger acid for the dark streaking, with a brush.

W. B. B., of O.—Single bands, rivetted, 6 inches wide, sell at 36c. per foot; best quality, double bands, 82c.—20 per cent less for hemlock tanned.

W. D. S., of Cal.—You had better keep your attention turned to the digging of the precious metal, than to inventing. No doubt but your idea of the best form for a paddle wheel are correct, but unless you improve upon the details of it, it will be no go—it is too complicated.

K. E. R., of Ala.—Impure phosphoretted hydrogen bursts spontaneously into flame whenever it mixes with air or pure oxygen gas. The luminous appearance which haunts meadows, etc., arises from putrifying animal and vegetable substances.

E. W., of New York.—We have never heard of an electric light for a watch: we do not know how you could do it: it would be valuable, if practicable.

E. A., of Pa.—A most excellent varnish to prevent rust is made of 1 pint of fat oil varnish mixed with 5 pints of highly rectified spirits of turpentine, rubbed on the iron or steel with a piece of sponge. This varnish may be applied to bright stoves and even mathematical instruments without injuring their delicate polish.

E. C., of Tenn —The carbon of the burning charcoal unites with the oxygen of the air, and forms carbonic acid gas, which is a narcotic poison. This is the reason why persons are killed by having charcoal fires in their rooms.

Money received on account of Patent Office business since April 9:—

B. & B., of Vt., $20; D. W. E., of N. Y., $20; G. W. P., of Ct., $55; E. S. C., of Mass., $15; G. S., of ——, $5; R. W. A., of Ct., $30; H. & E., of N. Y., $20; J. V. S., of O., $30; W. H., of Wis., $10.

Specifications and drawings of inventions belonging to parties with the following initials, have been forwarded to the Patent Office since April 9:

D. A., of N. Y.; C. L., of Phila.; C. W. Van V., of N. Y.; G. C. B., of Ark.

New Edition of the Patent Laws.

We have just issued another edition of the American Patent Laws, which was delayed until after the adjournment of the last Congress, on account of an expected modification in them. The pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office We shall continue to furnish them for 12 1-2 cts. per copy.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and enclosing one dollar as fee for copying.

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American and Foreign Patent Agency.

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Branches of our Agency have been established in London, under the charge of Messrs. Barlow, Payne & Parken, celebrated Attornies, and Editors of the "Patent Journal;" also in Paris, France, under the charge of M. Gardissal, Editor of the "Brevet d'Invention." We flatter ourselves that the facilities we possess for securing patents in all countries where the right is recognized, are not equalled by any other American house. MUNN & CO.,
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LAWRENCE SCIENTIFIC SCHOOL.—Harvard University, Cambridge, Mass.—Special Students attend daily, from 9 o'clock, A.M., till 5 o'clock, P. M., in the laboratories, and under the direction of the following Professors:—Louis Agassiz, Professor of Geology and Zoology; Jeffries Wyman, M. D., Professor of Comparative Anatomy; Henry L. Eustis, A. M., Professor of Engineering and Physiology; Eben Norton Horsford, A. M., Professor of Chemistry. Instruction is also given by Prof. Pierce in Mathematics; Prof. Lovering, in Physics, and the Messrs. Bond at the Astronomical Observatory. All lectures delivered to under-graduates of the College are free to members of the Scientific School. For further information apply to E. N. HORSFORD,
29 6* Dean of the Faculty.

LATHES FOR BROOM HANDLES, Etc. We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles, and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch, and work as smoothly as on a straight line, and does excellent work. Sold without frames for the low price of $25—boxed and shipped, with directions for setting up. Address, (post paid) MUNN & CO.,
At this Office.

1851 TO 1856—WOODWORTH'S PATENT PLANING MACHINE.—Ninety-six hunhredths of all the planed lumber used in our large cities and towns continues to be dressed with Woodworth's Patent Machines, which may be seen in constant operation in the steam planing mills at Boston, Philadelphia, New York, Albany, Troy, Utica, Rome, Syracuse, Geneva, Albion, Lockport, Buffalo, Jamestown, Gibson, Binghampton, Owego, &c. The price of a complete machine is from $100 to $1,000, according to size, capacity, and quality. Persons holding licenses from the subscriber are protected by him against infringements on their rights. For rights to use these machines in the Counties of Columbia, Dutchess, Queens, Richmond, Suffolk, Westchester, and other unoccupied counties and towns of New York and Northern Pennsylvania, apply to JOHN GIBSON, Planing Mills, Albany, N. Y.
27 eow6*

CLOCKS FOR CHURCHES, PUBLIC Buildings, Railroad Stations, &c.—The undersigned having succeeded in counteracting, effectually, the influence of the changes of temperature upon the pendulum, and introduced a new regulator, by which great accuracy of time is produced, also the retaining power (which keeps the clock going while being wound) are prepared to furnish Clocks superior to any made in the United States. Ample opportunity will be afforded to test their performance, and those not proving satisfactory, when completed may be rejected. Astronomical Clocks made and warranted equal to any imported.

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SHERRY & BYRAM,
Oakland Mills, Sag Harbor, L. I.

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"Mr. Byram is a rare mechanical genius."—[Journal of Com. 29 12eow*

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MUNN & CO., at this Office.

A CARD.—The undersigned beg leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton st. 29 3m*

WILLIAM W. HUBBELL—Attorney and Counsellor at Law, and Solicitor in Equity, Philadelphia, Penn.

MACHINES FOR CUTTING SHINGLES. The extraordinary success of Wood's Patent Shingle Machine, under every circumstance where it has been tried, fully establishes its superiority over any other machine for the purpose ever yet offered to the public. It received the first premium at the last Fair of the American Institute—where its operation was witnessed by hundreds. A few State rights remain unsold. Patented January 8th, 1850,—13 years more to run. Terms made easy to the purchaser. Address, (post-paid) JAMES D. JOHNSON, Redding Ridge, Conn., or Wm. WOOD, Westport, Conn.. All letters will be promptly attended to. 10tf

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SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., will have finished 2 Power Planers ready to ship by the 1st of Feb., that will plane 9 feet long, 31 inches wide, and 24 inches high, with angle feed; counter shaft, pullies, and hangers, splining and centre heads, with index plate, and weigh over 5,000 lbs.; also 2 power planers that will plane 5 feet long, 22 in. wide, and 20 in. high, with counter shaft, pullies, and hangers, and weigh 2,400 lbs.—These planers are 25 per cent. lower than any others built. Cuts can be had by addressing as above, post paid. 19tf

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by
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MACHINERY.—S. C. HILLS, No. 12 Platt Street, N. Y., dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines, Dick's Presses, Punches, and Shears; Morticing and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c. Letters to be noticed must be post paid. 26tf

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SASH AND BLIND MACHINE—Patented by Jesse Leavens, Springfield, Mass. The machine planes, molds, mortises, bores, tennons, copes, franks, cuts off, rips up the stuff, planes the blinds, shades, and sets out the sash. The machine is 4 by 5 feet, weighs 800 lbs., requires two horse-power to drive it, and cost $300 cash—extra charge for the right to use. Shop, town, county, and State rights for sale. Orders from abroad will be promptly attended to by addressing JESSE LEAVENS, Palmer Depot, Mass.
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Scientific Museum.

For the Scientific American.

To Remove Paint from Clothes.

Many persons by misfortune get paint on their clothes, and from the want of proper knowledge to remove it, their clothes are spoiled for all decent purposes. This is a great loss especially when fine clothes are spotted or daubed with paint. Many fine and excellent coats have, to our knowledge, been laid aside for common purposes, because of a few spots of paint. Paint can be very easily removed from woolen clothes, although it may be quite hardened. The way to do this is to pour some alcohol on the cloth, saturating the paint, and after it has remained on it for about ten minutes, pour on a little more, and then rub the cloth with the paint spots between the fingers. This cracks up and breaks the paint from the surface, after which a piece of clean sponge dipped in the alcohol, should be rubbed on the cloth, with the grain. Paint can be taken out of silk in the same way, only it is best to steep the part of the silk with the paint on it, in a cup containing the alcohol; and it will not do to rub the silk between the fingers, for fear of breaking and creasing its surface. This is true, as it respects lute string or any hard surfaced silk, but figured soft silk, may be gently rubbed. The way to treat the painted silk, is this, after it has been steeped for about 15 minutes, then it should be spread out on a board, and rubbed along the grain with the selvage, by a sponge dipped in the alcohol. This seldom fails to remove all paint. Some use camphene for removing paint, but alcohol is more cleanly. Black paint on a white surface, or even on any delicately colored surface, always leaves a stain, although the paint, itself, strictly speaking, may be removed. It is much easier to clean a white surface, than one of a light color, like French grey, lilac, pink, &c. For cleaning light colored cloths from paint, use only a clean sponge, or if a sponge is not handy, use a piece of clean white flannel.

All the ethers are very effective, in removing paint, also grease spots, but fish oil always leaves a stain, and is exceedingly difficult to remove. There are some who use colored oils for the hair, these always make a bad stain, especially those of a red color. The reason of this is that madder is used to color them, and this is a very permanent dye drug. The best substance for removing paint, grease, &c., from all kinds of clothes, those of the darkest and lightest colors, is that beautiful ether discovered by Prof. Simpson, in Scotland, a few years ago, and by Mr. Guthrie, of America, a few years before, unknown to the Doctor,—we mean chloroform. It is employed in the same manner as the alcohol, only care must be taken to work it more rapidly, as it is more volatile, and care must also be exercised so as not to inhale it. No one should use it but careful persons of mature years: it is of too high a price to be used in general, and young people, in no case, should be allowed to tamper with it.

After what has been said about the removal of paint and grease, no person need be much frightened at a paint stain on a fine cloth coat, but, at best, let us be candid and say, that upon silk it is not possible to remove the paint and leave the silk as it was before being injured. Prevention, in all cases, is better than cure, but misfortunes will take place and seldom come singly, therefore the above will be found useful and of great benefit to many.

George Hudson the Railway King.

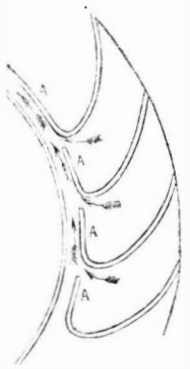
The only monarch, says an English journal, who, in spite of his dethronement, seems likely to regain his crown and his influence, is the over-praised and over-abused ex-King George Hudson. Having by the recent rise in Railway shares acquired an additional half-million of *tin*, and having never for one hour lost any of his *brass*, he is again coming into favor with the worshippers of Mammon, whose name is Legion, and will be by no means short of guests and flatterers at his approaching "Ball in High Life," at his very tall mansion at Albert Gate, Hyde Park. His career has been almost a justification of the worldly wisdom of that respectable parent, whose advice to his son was, "Get money—honestly if you can—but get money."

For the Scientific American.

Hydraulics.

(Continued from page 232.)

Fig. 42.



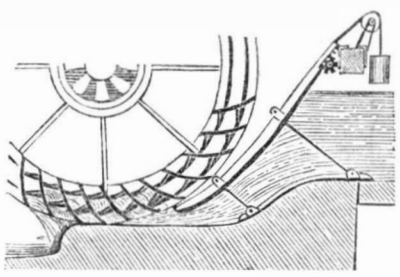
Breast Wheel with Close Sole and Ventilated Buckets.—This wheel is adapted for heights not exceeding 18 or 20 feet, and where it is subjected to back water. Every wheel of this kind should have capacity in the buckets to receive a sufficient quantity of water to force the wheel at full speed through a depth of five or six feet of backwater.

A wheel of this kind was erected, of one hundred horse power, for a flax mill at Whitehaven, England, about four years ago. It was 20 feet in diameter, 22 feet wide inside of the buckets, and 22 inches deep on the shroud. It had a close rivetted sole with buckets ventilated from one to the other as shown in fig. 42. The water is discharged upon the wheel by a circular shuttle lowered by a governor, as circumstances may require. The tail end of the buckets, A A A, are turned up at a distance of two inches from the back of the sole plate, and terminated within two inches from the bend of the upper bucket. The water in passing through the opening between the buckets drives the air before it in the direction of the arrows, into the buckets above, and so on in succession till each bucket is filled as it passes the aperture of the cistern from which the water flows upon the wheel. The buckets are thus cleared of air, the water is discharged with facility, and the air is again admitted at the bottom of the fall.

The wheels with ventilated buckets have received the strongest commendations from those who have used them. The ventilated wheels are more expensive than those which are not so essential for very high falls. It is important to carry the water down as near to the vertical centre as possible, so as to get the best effect from it, and yet begin to part with it as soon as that line is passed.

Poncelet Wheels.—The accompanying fig. 43 is a wheel that was built at Loubregat, in Italy, by M. De Bergue.

Fig. 43.



The diameter was sixteen feet eight inches, and the width was thirty feet, which, with a fall of six feet six inches, passed one hundred and twenty thousand cubic feet of water per minute, when the periphery travelled at a velocity of eleven to twenty feet per second. An ordinary breast-wheel would require to be ninety feet wide to use advantageously that quantity of water. It is found that the velocity of the periphery should be about fifty-five per cent. of that of the water flowing through the sluice, and upon these data the power of the wheel would be about one hundred and eighty horse power. The buckets were of curved form, and made of wrought-iron, one-eighth of an inch thick; and it would be observed, that there was a larger number of buckets than usual, and that the water came upon them at a tangent, through an orifice of of such a form and dimensions, as to allow the buckets to fill easily, at the rapid speed at which the periphery passed before the sluice. This great primary velocity was very important, as it caused a considerable saving in the gearing of the mill. The main shaft was formed by a hollow cylinder of cast-iron, four feet six inches diameter, in short lengths bolted together. The strain was brought entirely upon the main shaft, and the weight of the wheel was thus reduced to about thirty tons, which was very little for so powerful a machine. The sluice was formed of cast-iron plates, with planed joints, bolted through the flanches, to form one large shuttle, of the breadth of the wheel, and its motion was regulated by radial tie-rods, between the stone-apron and the back of the sluice, which could thus be raised with great facility by racks and pinions, and be regulated by the ordinary governor, the weight of the sluice being in a great degree supported by the water flowing beneath it on to the wheel. It moved very accurately between the side-walls of the pen-trough, and cup-leathers at each side prevented any waste of water. This kind of wheel was less affected by back-water than any other form, and the water acted upon it with its full power of velocity, without any impediment from the air in entering, as there was no sole-plate; the buckets were therefore filled and emptied with great facility. For low falls under 8 feet, this wheel is allowed to be very excellent.

Scientific Memoranda.

Velocity of Sound Over Wire.—Some experiments in regard to the velocity with which sound is communicated by means of iron wire, have just been reported to the Paris Academy of Sciences. The experiments were made upon the wires of the electric telegraph established along the Versailles railroad on the right bank of the Seine. The result was that sound is propagated over wire at the rate of 11,434 feet the second.

Curious Discovery of an Old Mine.—Near Wislock, in Baden, a large mine has lately been discovered, which it is supposed has not been worked for a thousand years, and then by the Romans, who sought only for silver and lead, and left everything else. The mine is said to contain some fifty thousand tons of oxide of zinc, used in the manufacture of zinc paint.

Giant Cotton Stalk.—The Montgomery (Alabama) Journal says: "We were shown a few days since by Mr. Coxe, one of the delegates from this quarter to the World's Fair in London, a section of an immense cotton stalk, which he will take with him as a specimen of the plant as it grows in the rich prairie bottoms of Alabama. The plant was twenty feet in height and bore one thousand bolls. It was grown on the plantation of Mr. P. A. Wray, of this county. Mr. Coke and brother will leave at an early period for Europe."

Poisonous Vessels.—Vessels of copper often give rise to poisoning. Though the metal undergoes but little change in a dry atmosphere, it is rusted if moisture be present, and its surface becomes covered with a green substance —carbonate of the protoxide of copper, a poisonous compound. It has sometimes happened, that a mother has, for want of knowledge, poisoned her family. Sour krout, when permitted to stand some time in a copper vessel, has produced death in a few hours. Cooks sometimes permit pickles to remain in copper vessels, that they may acquire a rich green color, which they do by absorbing poison.

Steam Communication.—The firm of Campbell & Arnott, of Liverpool, are building a line of screw steamers, to run between that city and Chagres. They have already established a house at Panama, and will forward goods, &c., to the Pacific by the American steamers running to San Francisco.

Curious Fact in Regard to Cotton.—Many years ago, the senior editor of this paper was informed by his venerable and hereditary friend, Samuel Maverick, Esq., of Pendleton, that when a boy, as clerk in the house of his uncle, Mr. Wm. Turpin, of Charleston, he assisted in packing the first bag of cotton ever sent to Liverpool from the United States. Mr. Maverick is still living, and we now export some two millions of bags of cotton every year. The cotton packed by Mr. Maverick was put up in the seed. This was long before Whitney's invention of the cotton gin. The consignee of this lone bag of cotton informed the house of Wadsworth & Turpin that he could not sell it, that it was valueless, and advised them to send no more. How little this faithful factor saw into futurity!—Southern Patriot.

The Thames Tunnel Company report that the receipts from this stupendous work are gradually increasing. The Tunnel has been converted into picture galleries. Each panel contains a view like that of the Southampton Water, the Isle of Wight, etc., etc.

LITERARY NOTICES.

General Theory of Bridge Construction.—This is a new work, by Herman Haupt, A. M., published by D. Appleton & Co., Broadway. It is devoted to an explanation of the general principles of the architecture of bridges. It is the fruit of a series of experiments on models, and of the examination of various structures in different parts of the country, especially in the State of Pennsylvania. In the opinion of the author, many serious defects exist in several important structures, that have escaped the observation of practical builders. He claims for his volume the merit of originality, all the propositions having been proved by entirely new demonstrations. The author is a C. E., and General Superintendant of the Pennsylvania Railroad. He has divided his work into two parts, the last one of which embraces much that is new and of the greatest consequence to engineers. The errors of other authors are pointed out, and the theoretical and practical are judiciously blended together. It is well illustrated and well printed. Both author and publisher deserve praise for the production of such a book. It is a valuable acquisition to the scientific works of our country, as it treats especially upon those bridges peculiar to America.

Iconographic Encyclopedia.—Part 18 of this useful and beautiful work is now published and ready for sale by Mr. Rudolph Garrigue, No. 2 Barclay st., N. Y. It contains plates 433 to 512: the illustrations are those of architecture. The engravings are very fine; they represent the different styles and the progress of the art, from the rude wigwam to the finished Parthenon. The Architecture of Egypt, India, and Greece, is beautifully illustrated. There are also some fine views of nautical machinery.

The American Keystone is the title of a new journal just commenced by Messrs. Callicot & Webster, 142 Nassau st., this city. It is devoted to the interests of freemasonry, but aside from this it contains a choice collection of literature and news. Terms, $2.

Nos. 34 and 36, Boston Edition of Shakspeare's Dramatic Works, are now issued; they embrace "King Lear," and "Romeo and Juliet." Two more numbers complete this elegant edition. Dewitt & Davenport, N. Y., agents.

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IN THE WORLD!
SIXTH VOLUME OF THE
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